Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

1. (currently amended) A medical image diagnosis support device, comprising:

a controller configured through a program of instructions, embodied in a non-transitory form in a computer readable medium, executable by the controller to include the following units:

an organ region setting unit for setting organ regions in medical images obtained by a medical imaging device;

a deformation ~~degree~~ calculating unit for calculating a deformation set of geometric parameters related to ~~in an image a degree of~~ deformation from normal shapes of the organ regions set by the organ region setting unit in said medical images;

a reference [[value]] storing unit for storing a reference set of geometric parameters related to ~~value~~ of the normal shapes of the organ regions;

a lesion detecting unit for detecting existence of at least one lesion in an organ region from amongst the organ regions set by the organ region setting unit based on ~~from a result of~~ comparing the reference [[value]] set of geometric parameters stored by the reference value storing unit with the ~~degree of~~ deformation set of geometric parameters calculated by the deformation ~~degree~~ calculating unit; and

an informing unit for at least one of visually informing and auditorily informing the existence of the lesion in [[of]] the organ region detected by the lesion detecting unit.

2. (currently amended) The medical image diagnosis support device according to claim 1, wherein the deformation ~~degree~~ calculation unit comprises:

a bifurcation detecting unit for detecting bifurcation into branches of an [[the]] organ region from amongst said organ regions;

a [[an]] unit for creating a plurality of cross-sections of the organ region diverged by the bifurcation detected by the bifurcation detecting unit; and

a distance calculating unit for calculating distances between or to said branches in ~~a shortest distance of an opposed peripheral portion between~~ each of the plurality of cross-sections, and

wherein the lesion detecting unit detects the existence of the lesion in the organ region based on including said distances in said deformation set of geometric parameters ~~the shortest distance of the opposed peripheral portion between the plurality of the cross-sections~~.

3. (currently amended) The medical image diagnosis support device according to claim 1, wherein the reference [[value]] storing unit stores a plurality of templates related to different sets of said reference geometric parameters ~~according to the degree of deformation calculated by the deformation degree calculating unit~~.

4. (currently amended) The medical image diagnosis support device according to claim 1, wherein the deformation ~~degree~~ calculating unit includes:

a cross-sectional image calculating unit for calculating cross-sectional images that are orthogonal to axial direction of [[the]] an organ region from amongst said organ regions; and

an extracting unit for extracting a lumen and an exterior of the organ region from the

cross-sectional images calculated by the cross-sectional image calculating unit and calculating a ~~degree of~~ deformation set of parameters related to deformation of the lumen and the exterior of the organ region extracted by the extracting unit.

5. (currently amended) The medical image diagnosis support device according to claim 1, wherein the deformation [[degree]] calculating unit includes:

an extracting unit for extracting [[a]] hollow viscera from an [[the]] organ region amongst said organ regions;

a notable region setting unit for setting a notable region of the hollow viscera extracted by the extracting unit; and

an unit for creating cross-sectional images of the hollow viscera extracted by the extracting unit based on the notable region set by the notable region setting unit , and

wherein the lesion detecting unit detects the existence of the lesion of the organ region based on ~~degree of~~ deformation of the cross-sectional images of the hollow viscera.

6. (previously presented) The medical image diagnosis support device according to claim 1, wherein the informing unit informs the existence of the lesion visually by displaying the lesion through colors or movement in displayed images.

7. (currently amended) The medical image diagnosis support device according to claim 6, wherein the informing unit displays visual presentation ~~is execute~~ by displaying cross-sectional images of the organ regions, and by highlighting lesion candidate portions detected by the lesion detecting unit, on the cross-sectional images.

8. (previously presented) The medical image diagnosis support device according to claim 1, wherein the informing unit informs the existence of the lesion auditorily by outputting it through voices and sounds, or a variance of the voices and sounds.

9. (currently amended) The medical image diagnosis support device according to claim 1, wherein said controller configured through the program of instructions further includes:

a cross-section extracting unit for extracting cross sections from a feature quantity of [[a]] hollow viscera on the medical images obtained by the medical imaging device;

a physical quantity calculating unit for calculating a physical quantity including radius, degree of circularity, and gravity point of the hollow viscera on the hollow viscera cross-sections extracted by the extracting unit;

an ROI calculating unit for calculating a region of interest based on the physical quantity calculated by the physical quantity calculating unit;

a 3-dimensional image creating unit for creating 3-dimensional images of the hollow viscera from the medical images including the cross sections of the hollow viscera extracted by the cross section extracting unit within the region of interest calculated by the ROI calculating unit; and

an image displaying unit for displaying the 3-dimensional images created by the 3-dimensional image creating unit.

10. (previously presented) The medical image diagnosis support device according to claim 9, wherein said controller configured through the program of instructions further includes a

center-line calculating unit for calculating a center line of the hollow viscera based on the gravity point of the hollow viscera cross sections calculated by the physical quantity calculating unit, wherein the image display unit displays the center line calculated by the center-line calculating unit together with the 3-dimensional images created by the 3-dimensional image creating unit.

11. (currently amended) A [[The]] medical image diagnosis support method comprises:

an organ region setting step of setting organ regions in medical images obtained by a medical imaging device;

a deformation ~~degree~~ calculating step of calculating a deformation set of geometric parameters related to ~~in an image a degree of~~ deformation from normal shapes of the organ regions set in the organ region setting step;

a reference [[value]] storing step of storing a reference set of geometric parameters related to ~~value of the~~ normal shapes of the organ regions;

a lesion detecting step of comparing the reference set of geometric parameters [[value]] stored in the reference [[value]] storing step with the ~~degree of~~ deformation set of geometric parameters calculated in the deformation ~~degree~~ calculating step, and detecting existence of lesion in an organ region from amongst the organ regions set in the organ region setting step, from a result of the comparison; and

an informing step of visually and/or auditorily informing the existence of the lesion.

12. (currently amended) The medical image diagnosis support method according to claim 11, further comprising:

detecting bifurcation into branches of an [[the]] organ region from amongst said organ regions;

creating a plurality of cross-section images of the bifurcated organ region; and

calculating distances between or to said branches in each of ~~a shortest distance of an opposed periphery portion to a spacing between~~ the plurality of cross-sectional images, and

wherein the lesion detecting step detects the existence of the lesion of the organ region based on including said distances in the deformation set of geometric parameters ~~the shortest distance of the opposed periphery between the plurality of the cross-sectional images~~.

13. (currently amended) The medical image diagnosis support method according to claim 11, further comprising:

storing a plurality of templates related to different sets of said reference geometric parameters ~~according to the degree of deformation calculated in the deformation degree calculating step of the organ regions~~.

14. (currently amended) The medical image diagnosis support method according to claim 11, further comprising:

a cross-sectional image calculating step for calculating cross-sectional images that are orthogonal to an axial direction of [[the]] an organ region from amongst said organ regions; and

an extracting step for extracting a lumen and an exterior of the organ region from the cross-sectional images calculated in the cross-sectional image calculating step, and calculating a deformation ~~degree~~ of the lumen and the exterior of the organ region.

15. (currently amended) The medical image diagnosis support method according to claim 11, wherein further comprising:

an extracting step for extracting [[a]] hollow viscera out of the organ regions set in the organ region setting step;

a notable region setting step for setting a notable region of the hollow viscera extracted in the extracting step; and

a step for creating cross-sectional images of the hollow viscera extracted in the extracting step based on the notable region set in the notable region setting step, and

wherein the lesion detecting step detects the existence of the lesion of the organ region based on the deformation ~~degree~~ of the cross-sectional images of the hollow viscera.

16. (previously presented) The medical image diagnosis support method according to claim 11, wherein the informing step informs the existence of the lesion visually through displaying the lesion by at least one of color tinting and and/or movement on a displayed image.

17. (previously presented) The medical image diagnosis support method according to claim 16, wherein the informing step includes displaying cross-sectional images of the organ regions set by the organ region setting step, and highlighting a lesion candidate portion on the cross-sectional images.

18. (previously presented) The medical image diagnosis support method according to

claim 11, wherein the informing step informs the existence of the lesion auditorily through outputting by at least one of voices, and/or sounds and a variance of voices and/or sounds.

19. (currently amended) The medical image diagnosis support method according to claim 11 further comprising:

a cross-sectional image extracting step for extracting cross sections from a feature quantity of [[a]] hollow viscera in cross-sectional images obtained by the medical imaging device;

a physical quantity calculating step for calculating a physical quantity including radius, degree of circularity and gravity point of the hollow viscera on the cross-sectional images;

an ROI calculating step for calculating a region of interest based on the physical quantity calculated in the physical quantity calculating step;

a 3-dimensional creating step for creating 3-dimensional images of the hollow viscera from the cross-sectional images including the cross-section of the hollow viscera within the region of interest; and

an image displaying step for displaying the 3-dimensional images.

20. (previously presented) The medical image diagnosis support method according to claim 19, further comprising:

a center line calculating step for calculating a center line of the hollow viscera based on the gravity point of the cross section of the hollow viscera calculated in the physical quantity calculating step,

wherein the image display step displays the center line calculated in the center line

calculating step together with the 3-dimensional images created in the 3-dimensional image creating step.